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|  | **Module** |  | **Course** |
| **Title** | Networking |  | Advanced Mobile Programming |
| **Code** | ITSE-M4511 |  | ITSE-3123 |
| **ECTS** |  |  | 7 |
| **Duration** |  | 16 Weeks | |
| **Academic Year** |  | 2021/22 | |

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| **Instructor’s Contact Information** | |
| **Name** | Michael Sheleme |
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| **Office Hours** | - |

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| **Course Description** |
| This course is a continuation of Mobile Programming course (ITSE-2122). In this course students will learn about Android Mobile application development concepts such as fragments; data storage mechanisms; background tasks; geo features such as location, places and google maps; graphics; mobile application architectures; unit and UI testing. The course has both lecture and laboratory sessions. The lecture session covers basic concepts whereas the lab sessions gives students a hands on experience on the topics covered in the lecture session |
| **Course Objectives** |
| Understand principles and best practices of mobile application development using android platform |
| **Learning Outcomes**  Upon completion of this course, students should be able to |
| * Develop Android mobile application using fragments, background tasks, google maps * Develop Android application that manage data using different storage alternatives provided by Android platform * Interact with web services using libraries * Unit Test Android Applications * Familiarize themselves with best practices of android application development * Explore different android application architectures and apply the recommended ones * Develop multimedia applications in Android |
| **Prerequisites:** |

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| ● ITSE-2122 Mobile Programming | | |  |
| Student Workload | | |  |
| **Lecture** | **Tutorial** | **Home Study** | **Laboratory** |
| 32 hrs. | 32 hrs | 65 hrs. | 48hrs |
| **Schedule** | | |  |
| **Weeks** | **Topics and Subtopics** | |  |
|  | **Lecture and Laboratory Sessions** | | **Assessment** |
| **Week 1** | Introduction | |  |
| **Week 2** | Basics of Kotlin | |  |
| **Week 3** | Fragments   * Fragment Lifecycle and Communication * Use Fragments with a ViewPager   ● Dialog Fragment   * Two-Pane Master Detail Interfaces | | Summiting Project Title |
| **Week 4 & 5** | Saving User Data   * Preferences and Settings   1. Data Storage   ○ Shared Preferences  ○ App Settings   * Storing Data with Room   1. SQLite Primer   Room, LiveData, and ViewModel   * File Storage * Firebase | | Comment on project  application features    Exam 1 |
| **Week 6 & 7** | Working in the background   * Background Tasks   1. AsyncTask and AsyncTaskLoader   ○ Broadcast receivers   * Connecting to the Web   1. Retrofit for REST API * Alarms and Schedulers   1. Notifications   ○ The alarm manager  ○ Job Scheduler | |  |
| **Week 8 & 9** | Add Geo Features to Your Apps   * Location   1. Location Service * Places   1. Places API * Mapping   1. Google Maps API | | Project Evaluation I Exam 2 |
| **Week 10 & 11** | Architecture Components   * Common architectural principles * Recommended Architecture | | Project Evaluation II |
|  | ● Best practices | |  |
| **Week 12 & 13** | Graphics   * Media   ○ Playing Audio and Video files   * Canvas * Animations | |  |
| **Week 14** | Testing Android Apps   * Unit Testing * Integration Testing | |  |
| **Week 15** | Make your apps fast and small | |  |
| **Week 16** | Revision and Final Exam | | |
| **Teaching Methods** | | | |
| * Lecture * Laboratory * Project work | | | |
| **Assessment Method** | | | |
| * Project Evaluation I (20 %) * Project Evaluation II (20 %) * Exam 1 (20 %) * Quiz (10%) * Assignment (10%) * Final Exam (20 %) | | | |
| **Course Policies** | | | |
| * **Attendance:** It is compulsory to attend class in time and every time. Missing more​ than 15% of the classes during the semester causes readmission for that course. * **Assignments:** No Late Assignment will be accepted​ * **Test/Quizzes:** Reexamination schedules will be arranged for those who missed​ exams by accidental or uncontrollable situation. Students are expected to provide formal evidence for their absentee. * **Cheating/Plagiarism:** The total result obtained for the assessment will be​ discarded for any kind of cheating/plagiarism | | | |
| **References** | | | |
| * Phillips, Bill, Chris Stewart, and Kristin Marsicano. Android programming : the Big Nerd Ranch guide. Atlanta, GA: Big Nerd Ranch, 2017 * https://developer.android.com/guide | | | |